

## Evaluation of antimicrobial susceptibility and integron carriage in *Helicobacter pylori* isolates from patients

Mehdi Goudarzi<sup>1</sup>, Mohsen Heidary<sup>2</sup>, Mehdi Azad<sup>3</sup>, Maryam Fazeli<sup>4</sup>, Hossein Goudarzi<sup>1</sup>

<sup>1</sup> Department of Microbiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran

<sup>2</sup> Department of Medical Microbiology, Faculty of Medicine, Iran University of Medical Sciences, Tehran, Iran

<sup>3</sup> Department of Medical Laboratory Sciences, School of Paramedicine, Qazvin University of Medical Sciences, Qazvin, Iran

<sup>4</sup> WHO Collaborating Center for Reference and Research on Rabies, Pasteur Institute of Iran, Tehran, Iran

### Abstract

**Aim:** The purpose of this study was to determine the antibiotic susceptibility pattern and distribution of integron in *H. pylori* isolates collected from patients referred to private health care centers in Tehran, Iran.

**Background:** Antibiotic resistance is the main reason for failure of *Helicobacter pylori* therapy. Integrons as genetic reservoirs play main roles in the dissemination of antimicrobial resistance gene.

**Methods:** During a 12-month cross-sectional study period, 65 *H. pylori* isolates were recovered from 124 biopsy specimens. Isolates were subjected to susceptibility testing using by Epsilometer test according to the European Committee on Antimicrobial Susceptibility Testing (EUCAST) guideline. PCR was used to detect different types of integrons.

**Results:** Antimicrobial susceptibility testing revealed that 73.8% of isolates were resistant to metronidazole, 43.1% to clarithromycin, 29.2% to tetracycline, 27.7% to amoxicillin, 23.1% to rifampicin and 13.4% to levofloxacin. Frequency of multidrug resistance among *H. pylori* isolates was 26.1%. The most predominant resistance profiles among our isolates were included resistance to clarithromycin and metronidazole (20%). Class 1 and 2 integrons were detected in 8 (12.3%) and 15 (23.1%) of the isolates, respectively.

**Conclusions:** The high prevalence of multidrug resistance and frequency of class 2 integron in this survey can be a warning for clinicians. Continuous surveillance is necessary for the development of new treatment protocols to prevent the treatment failures and also further spread of resistant isolates.

**Key words:** *H. pylori*, integron, Multidrug-Resistant

(Please cite as: Goudarzi M, Heidary M, Azad M, Fazeli M, Goudarzi H. Evaluation of antimicrobial susceptibility and integron carriage in *Helicobacter pylori* isolates from patients. *Gastroenterol Hepatol Bed Bench* 2016; 9(Suppl. 1): S47 – S52).

### Introduction

*Helicobacter pylori* (*H. pylori*) as one of the most common chronic bacterial infections colonize the stomachs of about 50- 60% of the world's population. The *H. pylori*-related digestive diseases can range from mild or chronic gastritis to peptic ulcer, gastric lymphoma and gastric cancer and appears to occur in childhood and in most cases remains for all lifetime. Based on the World Health Organization International Agency for Research on Cancer (WHO/IARC), this bacterium is considered in group 1 human carcinogen (1). From the past decades, this bacterial infection is a serious threat to public health in developing countries as

well as in developed countries (2).

Although the main routes of infection have not been clarified yet, it is well established that person-to-person contact, oral-oral and fecal-oral routes could be major routes of human infection (3). The prevalence of *H. pylori* infection varies globally in different populations and is associated with a geographic area, socioeconomic factors, personal hygiene and age (1, 3). Proper antibacterial therapy as an effective factor plays crucial role in the eradication of *H. pylori* and thereby reducing the severity of gastric disease symptoms or completes recovery of patients. Combination therapy with a variety of antimicrobial agents such as proton pump inhibitor (PPIs), macrolide and a  $\beta$ -lactam as an eradication regiment could be effective for treatment of *H. pylori* infections (4). Unfortunately, during the past several decades, with the emergence of multi-resistant strains, the successful treatment of *H. pylori* have been a challenge.

**Corresponding Author:** Hossein Goudarzi, PhD.  
Department of Microbiology, School of Medicine, Shahid Beheshti University of Medical Sciences, Tehran, Iran  
E-mail: gudarzim@yahoo.com